above-described perfect, and almost regular subdivision produced by the action of boiling muriatic acid.

Recent examinations into the development of buds have shown me that that cellular layer which is subsequently developed into tubes of the liber and so-called ligneous fibre, and extends as an uncoloured zone from above the medullary cone to the nucleus or rudiment of the bud, consists of extremely delicate, rather extended, prismatic, generally 4-, 5-, or 6-sided parenchymatous cells, which stand with their ends accurately one above the other, and are gradually converted by the absorption of their septa into the long fibrous cells or tubes of the liber. The regular abrupt cylindrical tubes into which the fibres of flax were decomposed by boiling in muriatic acid, are almost exactly of the same length as these tender parenchymatous cells in their fully developed state; and that the latter originate from the delicate cells of the medullary substance by gradual extension, may easily be observed in the terminal buds of the horse-chestnut and of the ash.

On the absorption of the septa of those cells, the superposed edges grow so intimately together that their union has not hitherto been observed, and the tube thus originated forms the first or fundamental layer of the membrane of the fibrous cell, the thickening of which follows as usual by deposition of new layers on the inner surface. I am induced to publish these short notices at present, as they may afford some indications tending to explain the origin of the fibres of the muscles and nerves of animals; at the same time I would recommend a careful attention to the spiral formations which muscular fibre exhibits often quite as plainly as the tubes of the liber. It also appears to me that distinct layers are perceptible in the membrane of the muscular fibre of fish.

XXIV.—*On some new Organic Remains in the Flint of Chalk.* By the Rev. J. B. Reade, M.A., F.R.S. With Plates VIII. and IX.

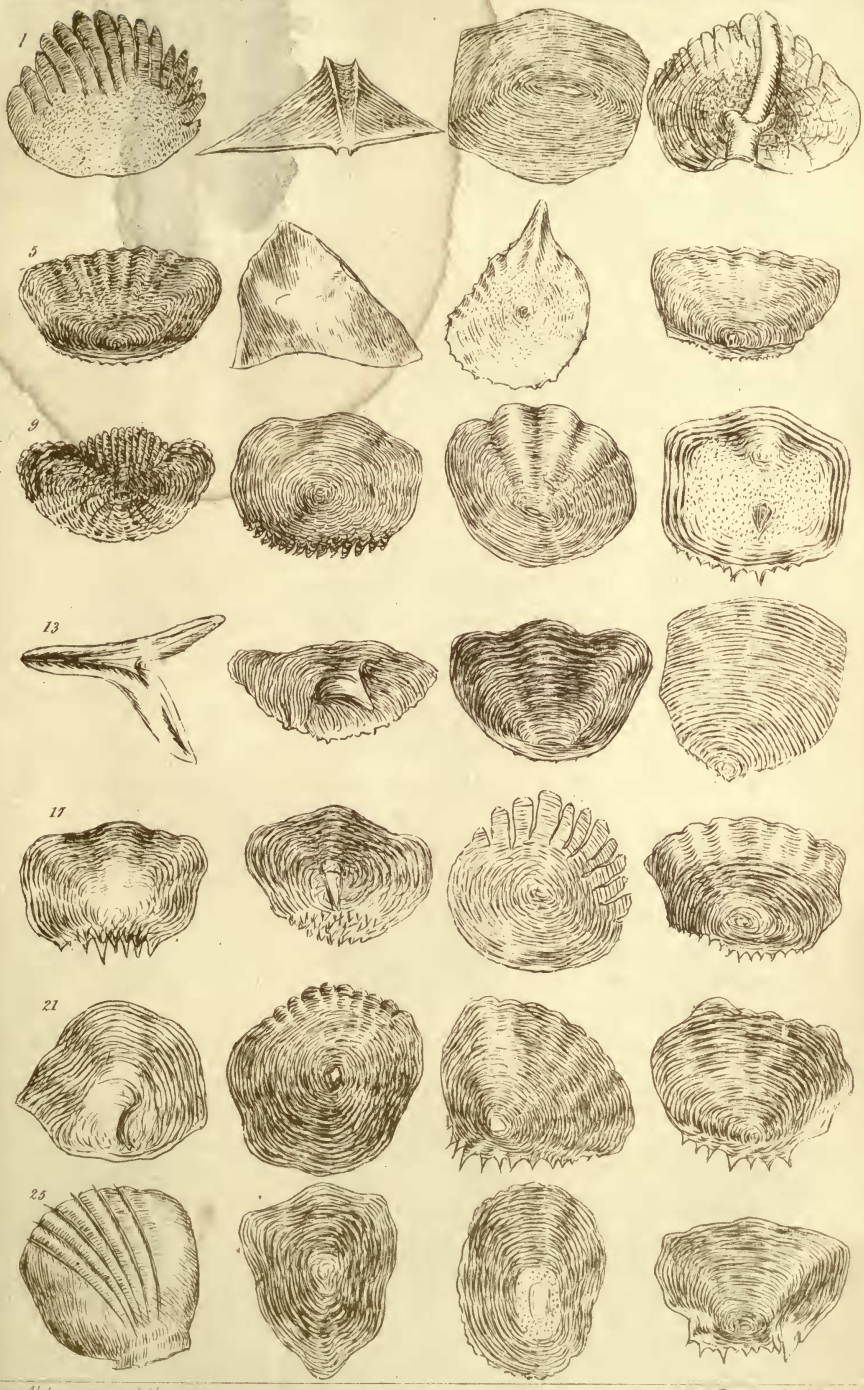
It is now very generally admitted that a geologist is as much in need of a microscope as of a hammer. Instruments of the latter class may indeed be sufficient for the exhumation of the

gigantic remains of Tilgate Forest; but accurately to follow out the workings of an Omnipotent agent, and to explore what may be justly termed the secret things in the kingdom of nature, puts into requisition the talent of our ablest opticians. Were any proof of this assertion necessary, it would more than suffice to refer, on the one hand, to the thousands of microscopic bodies which Mr. Lonsdale has discovered in chalk, or to the infinitely greater number of far more minute forms which Prof. Ehrenberg has discovered in the siliceous earths; and, on the other hand, to bear in mind that the results of the latter distinguished philosopher have set at rest the many unsatisfactory theories respecting the formation of the siliceous nodules of the chalk, and have naturally led to the conjecture, that, "as the formless cement in the semiopal of Bilin has been derived from the decomposition of animal remains, so also even those parts of chalk flints in which no organic structure can be recognised may nevertheless have constituted a part of microscopic animalcules."

A series of microscopic observations upon the ashes of plants which were commenced in the spring of 1837, led me, by steps heretofore stated in a communication to the British Association*, to examine into the condition of silica generally; and I not only can bear testimony to the accuracy of Prof. Ehrenberg's conclusion, that to a very great extent the organic remains of Infusoria swell the amount of solid matter of the crust of the earth, but I am able also to prove by careful experiments, that in plants certainly, and therefore probably in animals, the living principle is endowed with the power of elaborating out of their proper nutriment the solid materials or frame-work of their support. And hence the origin, and in the present day the increase both of silica and lime.

With respect to the agency of animalcules secreting carbonate of lime, it may be observed, that a thin transparent section of the Sussex marble shows in the most satisfactory manner, that the mouths of the *Paludinæ*, instead of being filled up with indurated marl, as was once supposed, abound with the remains of *Cyprides*, and that, in point of fact, the entire mass of the marble is nothing more than an aggregation of these

* Seventh Report. Transactions of the Sections, p. 103.



Lens Aldous, ad. et lith.
Printed by J. Basire

SCALES OF FISHES IN THE FLINT OF CHALK.

SCALES of EXISTING FISHES.

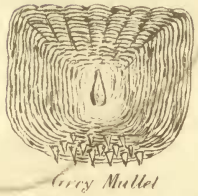
Whitebait.

Grayling.

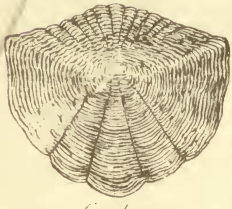
Carp.

Barbel.

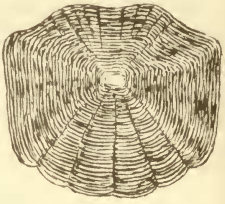
Red Gurnard.



Grey Mullet.



Gudgeon.



Dace.

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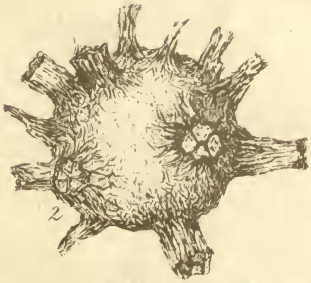

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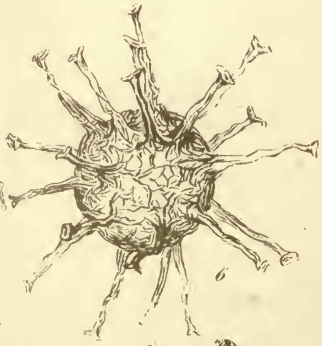

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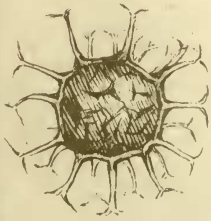

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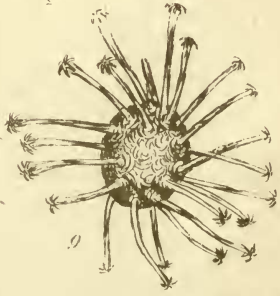

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Lens Aldous delt et lith.

Printed by J Basire

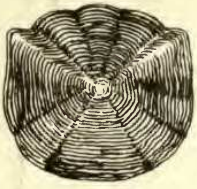
INFUSORIA IN FLINT.

1. Xanthidium furcatum. 2. X. crassipes. 3. D.o var. 3. X. hirsutum. 8. D.o
4. X. ramosum. 7. D.o 6. X. tuberculatum. 9. D.o

SCALES of EXISTING FISHES.


Whitebait.


Grayling.


Carp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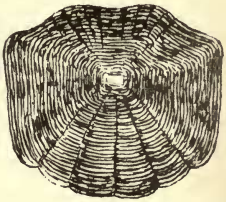
Red Gurnard


Grey Mullet


Gudgeon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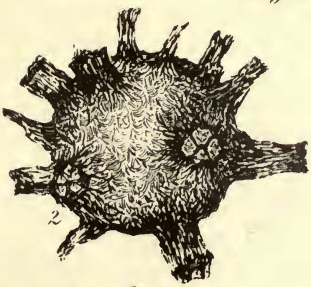
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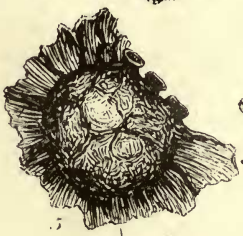
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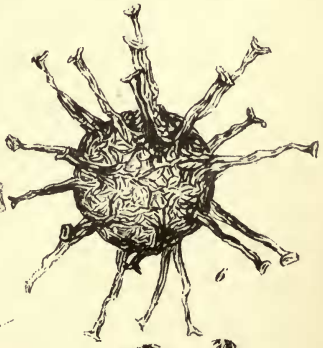
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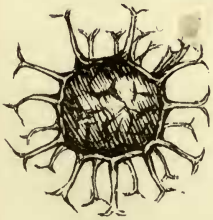
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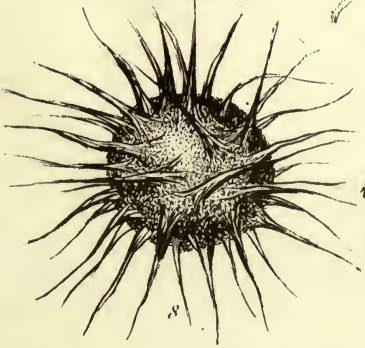
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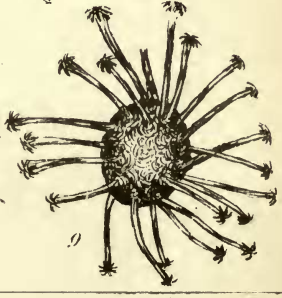
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Lens Meteors del et lith

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